Of the three elements carbon, hydrogen, and oxygen, the author concludes that:

"Each by itself, and all taken together, possess unique and prëeminent fitness for the organic mechanism."

Nor is the ocean forgotten, but comes in for a whole chapter and a warm encomium. The latter part of the book is devoted to a discussion on vitalism and teleology, and the author uses the "fitness" of things physical as an argument for a mechanistic interpretation of things organic. For the "fitness" of the physical world appears to imply teleology. Nevertheless, mechanism is enough. Hence the semblance of teleology is misleading, and therefore mechanism must suffice for biology also. Perhaps Dr. Henderson's position with regard to vitalism may best be illustrated by the remark of Laplace, which he himself quotes. When the philosopher was asked by Napoleon why the name of God did not occur in his *Mécanique céleste* he replied: "Sire, je n'ai pas besoin de cet hypothèse."

(4) Prof. Minot's book is the outcome of six lectures delivered by him at Jena in the capacity of "Exchange-Professor." After a preliminary lecture on the nature of cells he develops his views on the changes that occur in the life cycle from fertilisation until death. With fertilisation comes the inception of a process of rejuvenescence characterised by the formation of a number of undifferentiated cells, and with a great proportional increase in the total amount of nuclear material in the organism. Then comes a stage where the tissues develop, where they undergo a process of differentiation or cytomorphosis, as the author terms it. This is eventually followed by degeneration and ultimately by death. Death is the price paid for differentiation. Such is the tale. We rot and rot, but Prof. Minot sees the rotting starting earlier than the poet does. Senescence is the outcome of cytomorphosis, and as this is most active in comparatively early embryonic stages it follows that we are rotting most rapidly before we are born. After that we are let down more gently. The book rambles a good deal, and a chapter is devoted to the determination of sex, though it seems scarcely germane to the main thesis. Possibly it owes its place to its being an attractive subject for a course of semi-popular lectures.

(5) The last edition of this well-known work appeared in 1904, and was reviewed in NATURE for June 29, 1905. The greater part of the present edition is a reprint of the earlier one, but in one respect there is a change. Lectures 22–24, dealing with heredity, have been rewritten, and a fresh lecture added. The change was necessitated by the great progress made in these studies during the past few years owing to the discovery of Mendel's work. Weismann's second edition appeared four years after that discovery, and the matter was then dismissed in a few lines. To-day the position is accepted, and the author endeavours to bring the new facts into line with his theory. That the conception of segregation fits in a general way with his views on the nature of chromosomes is obvious. But, as he himself recognises, difficulties begin to appear as soon as the matter is more carefully considered.

One of the difficulties at the root of the chromosomal interpretation of hereditary factors is the fact that in some species already, *e.g.* Triticum, Lathyrus, and Antirrhinum, the number of factors identified is greater than the total number of chromosomes. Some investigators, notably Morgan, have sought to reconcile such cases with the chromosome hypothesis by means of Jansen's theory of "chiasmatypie," while others are inclined to question the sufficiency of the chromosome theory to explain segregation. Fresh facts, however, must decide the matter, and it is likely that the next few years will be critical years for Weismann's views. The present volume is of historical interest in showing the attitude of a great speculative mind when brought to face a new and unfamiliar body of facts, and it is much to be regretted that in shaping their interpretation a brain of such synthetic capacity is little likely to be available.

VON RICHTHOFEN'S "CHINA."

China: Ergebnisse eigener Reisen und darauf gegründeter Studien. Von Ferdinand Freiherr v. Richthofen. Dritter Band. Das südliche China. Herausgegeben von Ernst Tiessen. Pp. xxxi + 817 + 5 plates. Fünfter Band. Enthaltend die abschliessende palaeontologische Bearbeitung der Sammlungen F. von Richthofens, die Untersuchung weiterer Fossiler Reste aus den von ihm bereisten Provinzen sowie den Entwurf einer erdgeschichtlichen Uebersicht China's. By Dr. Fritz Frech. Pp. xii + 289 + 31 plates.

Atlas von China. Orographische und geologische Karten von Ferdinand Freiherr von Richthofen, zu des Verfassers Werk "China: Ergebnisse eigener Reisen und darauf gegründeter Studien." Zweite Abtheilung. Das südliche China (zum dritten Textband gehörig). Bearbeitet von Dr. M. Groll. Pp. 12 + plates 27–54. (Berlin: Dietrich Reimer, 1911–12.) Price, Bands III. and V., 32 marks; Atlas, 52 marks.

THESE volumes complete what may well be called the monumental work of Baron v. Richthofen on China, for the word is equally appropriate whether we regard the extent and

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importance of his researches, which will stand for all time as the foundation of our knowledge of the geology of the Chinese Empire, or whether we regard the fact that the author himself was only able to publish a portion of his work, the greater part having been prepared for and put through the press by the devoted industry of his friends and former pupils.

Of the two volumes before us, one contains v. Richthofen's account of his travels through southern China, edited and amplified by references to the observations of later travellers by E. Tiessen. These additions are most extensive in the account of the salt and gas fields of the upper Yangtsekiang, which v. Richthofen was prevented from visiting, where the ingenuity and indomitable perseverance of the Chinese have enabled them, in spite of the primitive nature of their appliances, to rival the achievements of the modern driller and to obtain a supply of natural gas from depths of 2000 ft. and even 3000 ft. The detailed observations of so acute an observer must always be of interest, and although all the more important results of his journey have already been published in one form or another, we welcome the completion of publication of the record, which will always be of importance and value to the student of the geology and physical geography of Eastern Asia.

The other volume is entirely the work of Dr. Fritz Frech, to whom Baron v. Richthofen entrusted the elaboration of the palæontological material collected by him. The description of the fossils is supplemented by a series of essays on the distribution and development of the different rock systems in China and Eastern Asia, and by a general review of the geographical evolution and the geological history of sea and land in China.

OUR BOOKSHELF.

Die gnomonische Projektion in ihrer Anwendung auf kristallographische Aufgaben. By Dr. H. E. Boeke. Pp. iv + 54. (Berlin: Gebrüder Borntraeger, 1913.) Price 3.50 marks.

THIS little book on the gnomonic projection of crystals is a welcome addition to crystallographic literature. The standard work on the subject, "Ueber Projektion und graphische Kristallberechnung," by Prof. V. Goldschmidt, of Heidelberg, was published in the year 1887, before the advent of the two-circle goniometer, which has both simplified the method and enlarged the field of usefulness of the gnomonic projection. The greater number of the subsequent improvements in the method we owe to Dr. G. F. Herbert Smith, Mr. H. Hilton, Dr. A. Hutchinson, Dr. J. W. Evans, Sir Henry Miers, Prof. von Fedorow, and Prof. F. E. Wright.

The gnomonic differs from the stereographic projection in that the plane of projection is a tangent plane to the sphere (within which the crystal is supposed to be concentrically situated), and the eye is imagined to be placed at the common centre of the sphere and crystal; while in the stereographic projection the eye is situated at the north or south pole of the sphere, and the plane of projection is that containing the equatorial great circle. Just as we have the most useful stereographic nets of Hutchinson, Penfield, and von Fedorow, so we have the gnomonic net of Hilton, and Herbert Smith has furnished us with a table to facilitate the plotting of the gnomonic diagram from the results of the measurements of the crystal made on the two-circle goniometer, an excellent type of which he has invented. With the exception that no mention appears to be made of the important work of Herbert Smith (no index is provided), Prof. Boeke has given in the concise space of fifty-four pages a very fair account of the principles of the method, together with some useful tables of chords and tangents. The illustrations are simple ones from original drawings of the author, and are very practical, but an obvious omission is that of a few typical gnomonic projections of fairly complex crystals belonging to each system of symmetry. Such a series of concrete examples would have afforded students a more comprehensive idea of the scope, possibilities, and actual application of the gnomonic projection.

A. E. H. T.

The Extra Pharmacopoeia of Martindale and Westcott. Revised by Dr. W. Harrison Martindale and Dr. W. Wynn Westcott. Fifteenth edition. Vol. i., pp. xxxi + 1114. Price 14*s*. net. Vol. ii., pp. viii + 370. Price 7*s*. net. (London: H. K. Lewis, 1912.)

THIS valuable work has now reached its fifteenth edition, eloquent testimony of its worth. The subject-matter has grown to so great an extent that it has been necessary to divide it into two volumes: the first, of more than 1000 pages, contains the description of the chemicals and drugs and the sections on vaccine and serum therapy, therapeutic index, &c.; the second embodies analytical and experimental work and a *résumé* of investigations on infective and other diseases. For the medical man and pharmacist, the book contains a wealth of information scarcely to be found in any other work, while numerous data are scattered through it which render it a volume of reference which will be found of the greatest service in the chemical and the biological laboratory.

R. T. H.

Practical Physiological Chemistry. By S. W. Cole. Third edition. Pp. xii + 230. (Cambridge: W. Heffer and Sons, Ltd., 1913.) Price 7*s*. 6*d*. net.

UNDER the title "Practical Exercises in Physiological Chemistry," this book was reviewed in the issue of NATURE for March 2, 1905 (vol. lxxi., p. 412). In the present edition Mr. Cole directs particular attention to analytical methods. He urges that medical students should be taught the micro-chemical methods of urinary analysis introduced by Folin, and that more conclusive qualitative methods should replace Fehling's sugar-test.

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